

Claims

1. A non-intrusive pressure transducer for detecting a pressure in a pressure line, the pressure line having an inner diameter and an outer diameter, the pressure transducer comprising:

a clamping cuff including a first arm having a first arm first end and a first arm second end, a second arm having a second arm first end and a second arm second end, the first and second arms being joined at the first portion first end and the second portion first end;

a sensor fastener for connecting the first arm second end and the second arm second end such that the first cuff and the second cuff fit snugly over the outer diameter of the pressure line to form a clamping cuff assembly, the sensor fastener having a diameter and comprising at least one attached strain gage, the clamping cuff assembly expanding and contracting as the pressure line expands and contracts, the pressure line expanding and contracting as the pressure increases and decreases, a length of the sensor fastener changing as the clamping cuff assembly expands and contracts, the at least one strain gage detecting the length of the sensor fastener.

2. The non-intrusive pressure transducer of claim 1, wherein the sensor fastener is tensile.

3. The non-intrusive pressure transducer of claim 1, wherein the sensor fastener is compressive.

4. The non-intrusive pressure transducer of claim 1, wherein the at least one strain gage comprises four strain gages equally spaced over the diameter of the sensor fastener.

5. The non-intrusive pressure transducer of claim 1, wherein the sensor fastener comprises a load cell.

6. The non-intrusive pressure transducer of claim 1, wherein at least one of the first arm and the second arm comprises a flexible portion of high tensile strength.

7. The non-intrusive pressure transducer of claim 6, wherein the flexible portion is formed from chainmail.

8. A method of detecting a pressure in a pressure line with a non-intrusive pressure transducer, the pressure transducer including a clamping cuff and a sensor fastener, the clamping cuff including: including a first arm having a first arm first end and a first arm second end, a second arm having a second arm first end and a second arm second end, the first and second cuff arms being joined at the first arm first end and the second arm first end; and a sensor fastener to connect the first arm second end and the second arm second end, the sensor fastener including at least one attached strain gage, the method comprising:

attaching the clamping cuff to the pressure line by fitting the first and second arms about the outer diameter of the pressure line;

connecting the first arm second end and the second arm second end with the sensor fastener to form a clamping cuff assembly;

allowing the clamping cuff assembly to expand and contract as the pressure increases and decreases and the pressure line expands and contracts accordingly, a length of the sensor fastener changing as the clamping cuff assembly expands and contracts;

detecting the length of the sensor fastener via the at least one strain gage;
and